about + 35° and lower, the temperature rose in the external auditory canal; whilst under the influence of + 8° and lower, the temperature fell in the external auditory canal. Hence the conclusion that under the influence of cold applications to the hand the determination of blood to the brain is diminished, and under the influence of warm applications to the hand it is increased. In a boy who had a defect in his frontal bone he studied the changes of volume in the brain in relation to the temperature of the external ear. For this purpose the changes in the volume of the brain were estimated, and simultaneously the temperature in the external auditory canal was measured. The experiment showed that under the influence of cold applications the volume of the brain increased, and at the same time the temperature in the external auditory canal fell, an opposite result ensued by warm applications. From these experiments it follows that the external auditory canal behaves towards thermic irritations as the peripheral parts of the body, and that the temperature of the peripheral parts by the irritation stands in antagonistic relation to the vessels of the brain. ISAAC OTT.

On the Modification of the Circulation of the Blood in the Brain During Chloroform Narcosis, Accompanied with Painful Excitation. By DRS. ANTONIO CARLE and GUISEPPE MUSSO. *Rivista Clinica, Gennaio*, 1880.

The following conclusions were deduced in the investigation of Drs. Carle and Musso on this subject:

1. Under the influence of the inhalations of chloroform there was a progressive diminution of the tonicity of the vessels of the brain. The circulation of this organ is slowed and there is produced a venous congestion.

2. In the period of complete narcosis and persistent anæsthesia the diminished tonicity of the vessels of the brain and the slowing of the circulation of the blood of this organ, which was initiated during the inhalation, there exists in the place of the above-mentioned congestion in the brain, an arterial anæmia.

3. This last condition of the cerebral circulation is not modified in an appreciable manner with the return of consciousness and sensibility of the individual, whence follows that this is not enough to explain the anæsthetic action of chloroform, and therefore the hypothesis is strengthened that chloroform anæsthesia may be due to a direct action of the chloroform on the nerve centres.

4. Chloroform anæsthesia does not withdraw entirely the nerve centres from the action of the strong peripheric irritation which increases in a transitory manner the tonicity of the vessels of the brain, and increases the circulation of this organ.

GRACE PECKHAM.

Physiological Studies of the Knee-Jerk, and of the Reactions of Muscles under Mechanical and other Ex-

citants. By S. Weir Mitchell and Morris J. Lewis. (*Medical News*, Feb. 13th and 20th, 1886.)

The authors have made an exhaustive study of the knee-jerks in all possible relations. The article is so laden down with details that it will be quite impossible to write a satisfactory review of it. The majority of the facts prove this, that muscular activity in any one part of the body removes a certain amount of inhibition from reflex acts simultaneously excited in any other part of the body. We have no comment to offer, not even on the authors' daring electrical experimentation (strong and but roughly estimated currents passed through the head), but in justice to them will append their own resumé.

The k.-j. varies in health, it may be exhausted by too much use, and may increase from frequent excitation.

All volitional acts, if strong enough, may increase the k.-j. of either leg, and even such small acts as winking, etc., are competent to do so under favoring circumstances.

Weak innervation of the crural nerve increases, and strong innervation of the same, prohibits k.-j.

All sciatic innervation increases k.-j.

Volitional reinforcement lasts for an appreciable time after volition ceases.

Continued violent muscular acts, as of both arms and hands, at last enfeeble the k.-j., and this enfeeblement lasts for an appreciable time.

Passive tension is not essential for the production of k.-j.

Moderate tension mechanically favors it.

Extreme tension destroys it, even in spastic cases, and this is probably mechanical in part, but also, and to a large degree, physiological.

An act of will directed to a part which is functionally inert, or to amputated parts, reinforces k.-j. Hence it is not the muscular motion which is the essential factor.

Strong or weak stimulation of one sciatic in an etherized animal, intensifies the k.-j. of the other leg ; pressure upon the sciatic in man, causing pain and numbness, diminishes the k.-j. of that leg.

Elbow-, ankle-, and jaw-jerks obey the same laws as the k.-j.

One k.-j. does not reinforce the other.

Mere touch has no effect on k.-j. All abrupt impressions, as of pain, heat, or cold, anywhere on the skin, increases k.-j.

Gustation has no effect on k.-j.

Violent optical impressions, in sensitive cases, increases k.-j.

Nitrate of amyl has no effect on k.-j.

Etherization, if profound, abolishes the k.-j. in dogs ; has less effect in rabbits.

All short faradic currents, anywhere, if strong enough to move muscles, increases k.-j.

The wire brush, with faradism on the dry skin, is one of the most effectual of all means of addition to k.-j.

Short galvanic currents, not strong enough to move muscles, give, under certain conditions, marked increase of k.-j.

Galvanism to temples especially, but also to other regions of the head, gives large reinforcements to k.-j.

Making circuit is more effectual than breaking, and these effects soon wear out.

The negative pole to temple gives greater and more constant increase of k.-j. than the positive in same position.

There is more effect on k.-j. from pole to temple than over leg-centres. Effect the same for either k.-j.

Galvanism to temples, with violent synchronous muscle acts, very greatly reinforces k.-j.

Long ascending spinal galvanic currents give good increase of k.-j.; descending, far less.

Moderate constant currents to spine do not reinforce k.-j.

The skin-reflexes (cremaster abdominal) are not reinforced by muscle acts or by pain.

When the belly of a muscle is struck, the resulting contraction obeys all the laws of reinforcement which apply to the k.-j. Tension has upon it much the same influence as on k.-j. One muscle jerk does not reinforce another.

The movement caused by electricity seems incapable of reinforcement.

Tension lessens the effect of even quite strong faradic currents as to pain and motion. B. S.

PATHOLOGY (INCLUDING PATHOLOGICAL ANATOMY) OF NERNOUS SYSTEM.

The Histological Changes in Multiple Sclerosis. By M. KÖPPEN. *Arch. f. Psych.*, xvii., 63.

Disseminated sclerosis appears in various parts of the central nervous system without any apparent law governing its local extent. Charcot's statement that the central cortex is exempt from the process is put in doubt by the case reported by Frommann ; and Erb has shown that Buchwald's assertion that the anterior and lateral columns of the cord are the regions chiefly involved is not based on fact. Schlute has held that the process begins in the brain. Putzar, however, holds that it may commence in the cord. The changes which were at first supposed to be limited to small foci are now known to be at least in some cases diffuse. The basis substance of the focus of disease is spoken of as a semi-fluid gray sticky material, as a structureless interstitial material, and as a fibrillary tissue produced by an increase in neuroglia fibres. How the short neuroglia fibres can change into long connective-tissue fibrillæ is not explained. In the focus cells are described of large size with distinct nuclei, the giant cells of Chvostek—supposed to be collections of protoplasm about nuclei already present, and extending themselves outward in branching processes. Spindle-shaped cells are also described in the basis substance